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MONTHLY REPORT
OFFICES OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

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MONTHLY REPORT
OFFICES OF FOREST EXPERIMENT STATIONS AND DENDROLOGY
August, 1924

FOREST EXPERIMENT STATIONS
Washington

The month of July has been essentially a field month for most of the men in Washington. Shepard returned from a trip to the Northeastern Experiment Station where he had gone to work with Mr. Dana in New England. Practically the entire month of July was spent in visiting the various projects under way and in assisting in developing in the program for the Station's work in the future. Mr. Shepard returned to Washington early in August, relieving the work there so as to permit other members of the organization to get out into the field.

Mr. Clapp left early in August for an extended western trip which will take him around the circle of all the Forest Experiment Stations. He went directly to D-6 where he conferred with Mr. Munger, the director of the new Pacific Experiment Station, on the development of the work there. Considerable time was spent in determining upon the location of the Station and recommendation has been made to the Secretary that Portland be chosen as headquarters. The work at Wind River will be continued as a field station of the larger station.

From D-6 Mr. Clapp went to D-1 and from there to D-2, where, with Bates and Weidman, he made an extended trip through the forests of the northern part of the District. His plans for September call for a short visit in D-4, a trip to D-5, and a return to Washington through the Southwestern Experiment Station.

Munns left Washington the latter part of July and after spending a few days at St. Paul going over the work with Zon and Mitchell, who were in the office at the time, he left for the Priest River Station. A little over two weeks was spent in western Montana and northern Idaho getting acquainted with the region and the work under way and in going over the various projects in the field with the men. The nursery at Savenac, the big 1910 burn near Wallace, the yield study work on the Kaniksu and the demonstration forest at Priest River were the principal points visited. The balance of the month was spent in D-6. The projects already under way at the Wind River Station were gone into and the work discussed in detail with the men engaged in it. A number of trips were made from Carson to visit the various plots which have been established in connection with the work which has been under way for a good many years. After a short visit in D-5 Munns plans to return to Washington through Flagstaff and D-3.

The early part of the month Donald Bruce left Washington for a field trip extending for a period of three weeks in the southern pine region where he spent most of his time with Hine on the southern pine growth study. On this work a recheck was made of some of the original measurements obtained in the past few years and a field examination made to determine how far the data secured in the study is adequate and can be used. Bruce met Hine at New Orleans and after spending a few days near Jackson, Miss., they were joined by Forbes at Athens, Ga. The party then visited a number of points in that State and separated at Waycross.

The bulk of the time in Forest Measurements has been spent on the recheck of the southern pine growth study, together with a number of other miscellaneous activities, since a little progress was made on the regional volume table for the western yellow pine - a considerable portion of the data being put upon punch cards. The sorting and tabulating units of the machine were installed the early part of the month and are now in operation. It has already been demonstrated that the punch card system can be used to check up on the original data and to secure correlations which would take many weeks of effort were they worked out by mathematical formula.

EDITOR'S OFFICE

The following sentences were not taken from manuscripts submitted, but are typical of examples found frequently. The original sentence is given, with words to be omitted underscored and those to be inserted given in parentheses.

"There are many other stands containing defective trees."

"There are (On) some plots where older trees predominate."

"There has been some reproduction (has come in) subsequent to the fire."

"It is believed by several investigators (believe) that growth is accelerated by this means."

"There is a probability that fires (probably) occurred more frequently under such conditions."

"There is (The stand affords) little direct evidence in the stand of the damage."

"The principal use of walnut is in the manufacture of (used principally in making) furniture."

"The drainage of the area is accomplished (drained) by three streams."

"The laying out of the plot was carried out (laid out) by ------."

"Confirmation of these data cannot yet be obtained (confirmed)."

"The instruments varied and comparison of them could not be made (compared)."

"The type is larch-fir, although (but includes) some spruce is included."

"The region contains much burned-over land and brushland is found very extensively."

"It is believed to be probably lack of moisture."

The mistakes in the following sentences, due to misplaced words and phrases, will be obvious with little study, but it is strange how many examples similar to these are found in manuscripts that have been prepared with great care.

"In 1950 it is probable that paper consumption will reach its maximum."

"The area was cut over with little regard for new growth fifty years ago."

"The samples were preserved for analysis in a paraffine-sealed tube."

"Care should be taken to see whether the instruments become damaged by frequent examination."

LAKE STATES FOREST EXPERIMENT STATION

The three main projects, the yield study of jack pine, the results of reforestation, and the analysis of forest fire statistics, was the principal field work during August.

The analysis of fire statistics data for Minnesota is nearly completed. A stage has now been reached in the analysis where it is possible to draw conclusions. The work for Minnesota will be completed about the middle of September. J. A. Mitchell, after the close of August, plans to extend the work to Michigan, where it will be carried on in cooperation with the Department of Conservation at Lansing.

Kittredge, in his study of the results of reforestation, completed the survey of Michigan and the latter part of August moved on to Wisconsin. He expects to complete the survey of all three States by about September 20.

Wackerman carried on his determination of the yield of jack pine stands of different degrees of density on the Higgins Lake State Forest, on the Michigan National Forest, and on some private lands in the vicinity of Mio. These localities provided a complete series of age classes and densities of stocking. If there is any difference between these localities in the rate of growth of jack pine, it should become apparent in the computation. At present, however, there seems to be no appreciable difference in the rate of growth or development of jack pine. The aim of this phase of the study is to supplement the yield table for well-stocked stands of jack pine - the field data for which has already been secured - with tables of reduction factors for the growth of poor, medium, and average good stands. This work was completed at the end of August and Wackerman returned to headquarters. There remains only a small amount of field work still to be done in Minnesota. The plan is to finish the work in Minnesota this fall and to complete the computation of the jack pine yield study during the winter.

Zon, in cooperation with the State Forest Service, continued the study of the results of cutting on the State-owned lands for the purpose of outlining a policy of handling State-owned timber. In connection with this work he also visited the Superior National Forest and went over recent and old cuttings in the black spruce swamp type. The bulk of the State-owned forest land is in the black spruce swamp type, a forest very difficult to handle.

On the whole, this was a quiet month, as far as correspondence, addresses, and general publicity work was concerned.

CLOQUET FOREST EXPERIMENT STATION

Probstfield, with an assistant, has been in the field studying the rate of establishment of stands of second growth after cutting.

The indications are that there will be a bumper crop of Norway pine cones this year. The station has already on hand very nearly 300 bushels of cones, belonging to the State forest service. Additional cones are coming in from private individuals with the request that they be dried and the seed extracted.

An 80-foot steel tower has been erected by the State forest service on the experiment station area. Most of the land now owned by the station can be seen from this tower, as well as much surrounding territory.

A statement was prepared on the activities of the Cloquet Experiment Station for inclusion in the general popular report on the work of the Experiment Station of the University of Minnesota.

PRIEST RIVER FOREST EXPERIMENT STATION (July)

Weidman was at the Priest River field station the first half of July and returned there toward the end of the month. In the interim he spent five days visiting the field work of Larsen and Haig, several days reconnoitering the yellow pine belt between Coeur d'Alene and Deer Park, Idaho, and a week in Missoula. Effort on individual work was put chiefly on various matters connected with the demonstration forest, yellow pine data and the preparation of a dondensed public requirements report for distribution to the interested agencies.

The study of reproduction after fires took most of the time of Larsen and one field assistant. More than three weeks were spent in the region at the head of the St. Joe River, between 30 and 40 miles up from Avery, Idaho. Transects were run in single 1910 burns and double burns resulting from the fires of 1889 and 1910. It is generally the observation among forest officers in this region that single burns reproduce naturally, no matter how severe the fire. The 1910 burns of the upper St. Joe country, however, were regarded by local officers as not reproducing except to a little lodgepole. Larsen's transects actually revealed quite a little white pine. This is 6 to 36 inches tall and largely hidden by the brush, whereas the weedlike lodgepole is about 8 feet tall. Practically all this reproduction started in the first 5 years following the fire. Although the field data have not been worked up, it is believed that there is more than enough reproduction of desirable species to make artificial reforestation unnecessary in this locality, except for some of the severely dry south and west slopes. Even the double burns of 1889 and 1910 contained 50 to 200 seedlings an acre, very largely of western white pine. Restocking here, however, is almost wholly lacking on the dry south aspects.

The white pine yield study was conducted at three localities on the St. Joe and Coeur d'Alene Forests during the month. Haig started the work with one field assistant. Towards the end of the month another field assistant was added to the crew. Only temporary plots, 1/8 and 1/4 acre in size, are being taken this summer. The chief object of the present work, it will be recalled, is to determine a practicable method of applying normal yield tables to actual stands. So far 18 plots have been taken in 120-year old stands, 20 plots in 50-year old stands, and 20 plots in stands 40 years old. When the crew finishes at its present locality it will move into 80-year old timber and later into a body 30 years old. Although normal stands are not being selected in this work, such plots as fall in stands within the limits of normality will be used to increase the basis of our yield table.

The reading of instruments and periodic oven-drying and measurement of various forest materials, along with the various other routine work of the fire studies, kept Gisborne at the Priest River Station until the third week of July. The last week of the month was spent on a trip to the Flathead Forest, where in the company of the Forest Supervisor one small going fire and three lookouts were visited. When the

fire situation was at its worst in June and July and when Gisborne should have spent weeks on the larger going fires, he was least able to get away. Without a temporary assistant for the fire studies in the summer, this will continue to be the case, for the regular personnel cannot absorb his routine work longer than a week.

During July Wahlenberg made the second examination of the plantations set out in the survival project last spring. A start was made on control for the extension of the map of the Dry Creek area bearing experimental plantations. Four days were available for this work with one assistant. About three days' time was contributed to the local ranger district on fire duty. Seed testing in the greenhouse was completed July 14. Some laboratory work on soils has been done between times. Mr. Juhlin Dannfelt, Swedish forester, was a visitor at Savenac Nursery on July 9. He was interested in the nursery and experimental work in general, but was especially interested in the chemical weed control work. He will test our method of chemical weeding in Sweden next spring and has promised to let us know what success he has there.

No rain was received in July at Savenac Nursery until the 18th and hot, clear days were abundant. This, together with deficiencies in precipitation during March, April, May, and June this year has caused very heavy losses in last spring's experimental plantations. Last year a moist season resulted in such uniformly high survival that no comparisons of much value could be drawn from our various tests until the dry time in September. This year appears to be much the reverse, in that our most valuable records from the experimental plantations have been taken or will soon be taken - the rather uniformly high mortality making later comparisons of less value. This does not apply to the tests of previous years, many of which it is planned to examine late this summer or fall.

Kempff reports a varied occupation of his time for July with some maintenance work, some timber sale scaling, setting of grade stakes and supervision on the Benton Creek Road project, looking over the next timber sale chance on the demonstration forest with Weidman, 4 or 5 days with such visitors as Messrs. Kelley, Olson, and Dannfelt, several days with Weidman looking over yellow pine country away from the station, and absorbing Gisborne's work for a week during the latter's absence on the Flathead Forest.

Visitors to the field station this month included E. W. Kelley (in connection with the fire studies and the permanent fire line), D. S. Olson (in connection with planting projects on the demonstration forest), and Mr. Juhlin Dannfelt of the Swedish forest service, who spent three days getting acquainted with our experiments and our forest conditions. Another visiting party included W. A. Fairburn, president of the Diamond Match Company, and family, together with R. A. Colgan, J. S. Barron and E. C. Olson, also connected with this company.

In August the Priest River Station had the experience of having two visits from the Branch crowded into one month. Mr. Clapp spent a short time with us in the latter part of the month and Mr. Munns was with us two weeks ending August 17. Munns went over the field work in detail, visiting, in company with Weidman, the studies of Larsen, Haig, Wahlenberg, and Gisborne, and the work at the demonstration forest under Kempff. A very close scrutiny of our work resulted from this visit and much of advantage will be gained from it. Following Mr. Clapp's short stay in Missoula, Weidman joined him on his trip to District 2, spending about eight days with him and Bates visiting sample plots and timber sales on the Washakie, Black Hills, and Harney Forests. Sample plot practice in thinning and methods of cutting, and the subject of experimental centers were the main topics of the conference between Messrs. Clapp, Bates, and Weidman. In returning from the Black Hills, Weidman spent several days on the Custer Forest in District 1 looking over locally-established sample plots with a view to making a permanent record of them in the Investigative Program.

Larsen's time this month was spent partly with Munns and Weidman in the field on the yield and reproduction-after-fires studies, partly on leave for 12 days, and partly in the lodgepole region engaged on an increment study of old cuttings with the local forest examiner on the Gallatin Forest. Two weeks were devoted to this work, most of the time on the Gallatin Forest and several days on the Deerlodge Forest. On the former Forest the work was done in a 32-year-old cut-over area embracing various degrees of selection and clear cutting. Larsen reports the area very favorable for the study of increased growth and reproduction.

Gisborne spent the first week of the month in the office and the remainder at the Priest River field station.

Haig has been on the white pine yield study the entire month, working with two field assistants at three localities on the Coeur d'Alene Forest. This work has been largely in 30 and 80-year-old stands.

Wahlenberg reports that the July examination of the south slope survival plantation of last spring yielded the following percentages of survival:

Western Yellow Pine	Root Lengths in Inches		
Class of Stock	6"	8"	10"
1-2 stock, large size plants	24%	41%	50%
1-2 stock, medium size plants	10%	24%	28%
1-2 stock, small size plants	9%	8%	32%
2-0 stock, medium size plants	--	8%	--

Some irregularities which may have a bearing on these results have been discovered and will soon be reported in a memorandum on methods and quality of planting work. These figures are reported here because of the consistent trends which they show. Each figure is based on from 375 to 500 planted trees, and as a group they will be a useful contribution to our knowledge of relative drought resistance.

A similar plantation on a west slope was also examined, but the survival in all tests is exceedingly low and not much meaning can be assigned to the figures. During the month of May when newly planted trees should have moisture in becoming adjusted to the new soil medium, only 0.11 inch was actually received in precipitation. The one outstanding reason for the failure of this plantation is that the moist soil in which the trees were planted dried out during May.

During August a rather thorough examination was made of the nursery soils with respect to acidity. The approximate hydrogen-ion concentration expressed in terms of pH values was studied by means of 110 separate determinations representing the different fields. Especial attention was given to the lower bench on which the trees were unhealthy last year. "Soiltex" solution was used as the reagent and the results secured check closely with the pH values as reported by the Bureau of Soils in a letter just received summarizing the results of their laboratory work on soil samples. The nursery management is taking immediate action on recommendations as to lime requirements and expects to treat the ground used for sowing this fall.

The Class C fire on the middle fork of Big Creek of the Lolo Forest which occurred in July this year left a clean burn only about four miles from the nursery. One day was spent in scouting this burn. Arrangements will be made for the reservation of area suitable for forestation experiments.

The absence of administrative officers made it necessary for Wahlenberg to stay close to nursery headquarters for three weeks this month. Messrs. Munns, Weidman, and Larsen spent a day going over the forestation projects on August 8. On August 22 the annual seed testing report for this year was issued.

Kempff's time at the demonstration forest was occupied with the work of timber sales, road construction, maintenance, etc., which usually take up the greater part of the resident officer's time in the summer months.

General

Despite the warm weather Forbes and Hine spent the greater part of August in the field. Mr. Forbes returned to New Orleans from his Washington trip and vacation on the night of the 6th. Mr. Donald Bruce, who has been working on our second-growth pine study in Washington, arrived here during the day and spent his time discussing with Hine and Hadley the southern pine and tupelo data already collected. Messrs. Bruce and Hine left the night of the 6th, after a brief consultation with the Director, for Jackson, Mississippi, and Athens, Georgia, where they were later joined by Mr. Forbes. A recheck was made of some of the plots previously selected in the second-growtn pine study. What they found is discussed under another heading.

On the 21st, Mrssrs. Forbes and Hine left Bruce and proceeded in the newly-acquired Government-owned Ford to Jacksonville and thence to Starke, Florida, where Messrs. Wyman and Shivery were awaiting their arrival.

While on this trip Forbes looked around for suitable locations for future branch stations. He also made notes of the merits and demerits of the various places visited for comparison with New Orleans as a central headquarters.

Mr. Hadley occupied most of his time serving as Acting Director.

Already the advantage to us of Mr. Shivery's knowledge of soil classification has been revealed. He was kind enough to examine the soil at Sampson Lake, Fla., and we feel sure that this and future classifications will be very beneficial to us.

PROTECTION

Fire. During the latter part of the month Messrs. Wyman and Shivery visited the Raiford, Florida, fire plots, which were laid out last year by Forbes and Wyman. They report these plots to be in good condition.

Measurements

Messrs. Forbes, Bruce, and Hine spent about three weeks on this study. Some 57 of Hine's plots in the vicinity of Jackson, Mississippi, and Athens, Ga., were visited. Bruce and the Director made the recheck. At the end of the trip a conference between Bruce, Forbes, and Hine was held at Waycross, Georgia. The conclusions reached and recommendations for further work have been summarized in a memorandum.

They report many areas suitable for plot measurements were seen along the way. Loblolly was most plentiful, while shortleaf and longleaf were occasionally found. It is estimated that 90 per cent or more of the slash and longleaf pines suitable for turpentining in this region is being bled.

It was found that the biggest gap in the data for the southern pine growth study was in slash pine of the older age classes. Five very good plots were measured by Forbes, Hine, and Shivery during the last week in August. Several more have been located around Starke and Jacksonville. Ten trees were cut in a worm "deadening" and their measurements were taken to build up the volume table data. Plans have been laid to complete the collection of field data for all the southern pines within the next few months.

Mr. Shivery spent the first three weeks of this month in the office of Computation in Washington, working on the computation, compilation, and smoothing out of data collected on the southern pine growth study.

Naval Stores

During the last week Forbes, Shivery, and Hine spent parts of several days in assisting Wyman and attempting to become familiar with his problems in the field. Wyman received considerable assistance from them.

Director Forbes reviewed Wyman's article entitled "How Fast Should a Face be Raised in Chipping Timber?" It has since been approved by the Washington office and will appear in the Weekly Naval Stores Review. This is the first of several articles to be prepared by Wyman for this publication.

Forbes, Hine, and Shivery visited with Wyman the Powell and Sampson Lake tracts. They discussed at length the naval stores projects. Forbes took advantage of his visit to also discuss with Wyman the plans for future naval stores work.

Chips from the Powell tract were sent Miss Gerry.

Wyman supervised the usual chipping, dipping, and weighing of the timber on the Powell and Sampson Lake tracts.

Hine and Shivery made a thorough recheck of the figures appearing in Wyman's annual reports on slash and longleaf naval stores work at Starke.

Forestation

Hadley spent several days at Bogalusa, when he examined and took notes of our experimental seed beds and the commercial seed beds of the Great Southern Lumber Company. He conferred with Mr. J. K. Johnson of the Great Southern Lumber Company on several nursery and planting matters. Chief among these was the method for controlling the scale Toumeyella, which infestation has practically taken possession of the company's pine nursery.

FREMONT EXPERIMENT STATION

August Activities

Roeser returned to the station August 4 and took up again the routine activities.

Mr. Chester A. Smiley, a vocational student at Colorado Agricultural College, arrived at the station about this time, and after a few days spent on other work, was assigned the annual stunt of counting reproduction on the (Mc-4) Douglas fir cutting plots. Mr. Smiley will use the information obtained in the preparation of a thesis which will attest his summer's activity to the vocational board. His job completed, he returned to Ft. Collins about the 26th.

Bates left on August 5 for the Leadville and Holy Cross Forests, where permanent sample plots were remeasured, and the increment-borer study of cut-over areas started for the local men to carry forward. In the case of the Leadville Mc-5 plots in spruce-balsam stands, on which heretofore small reproduction has been counted in order to show the relative tendencies of the two species immediately after cutting, the decision was reached that from now on these tendencies can be just as well evidenced by the measurement of trees as they attain to a height of 4.5 feet, and hereafter the entire stress will be laid on the precise measurement of the trees for growth purposes, rather than detailed study of reproduction results, which are already quite well demonstrated. To this end, at this examination all trees 1" and over D.B.H. were tagged, and all others over 4.5' high were also recorded by diameter.

Returning on the 21st, Bates left again on the 26th for Casper where he met Messrs. Clapp and Weidman for a complete survey of the permanent sample plots on the Washakie, Black Hills, Harney, Medicine Bow, Arapaho, Holy Cross, Leadville, Cochetopa and Gunnison Forests. Weidman left the party after a short study of the yellow pine in the Black Hills. The primary object of the more general inspection by Mr. Clapp has been to decide whether the method of scattering sample plots, which has been practiced in District 2, is justified by the diversity of physical conditions, the assistance which is obtained from administrative men, the direct benefit to administrative men of partaking in this

work, and the benefit to both Research and administrative men of the contacts which are made possible through this work. District 2 believes that these advantages far outweigh any possible advantages of having sample plots concentrated in a few localities.

September Plans

The above schedule was completed on the 14th and thereafter Bates will be largely engaged in station work for the remainder of the month, as will also the balance of the staff. Aside from seed extraction tests with yellow pine cones, there are no special projects demanding attention at this period.

NORTHEASTERN FOREST EXPERIMENT STATION

Field work on all three of the principal management projects was continued during the month. Both Behre and Meyer completed their ~~xxxx~~ work in Maine, and Meyer spent some time scouting for localities having stands suitable for yield plots in Vermont.

About the middle of the month nearly the entire station staff assembled at Twin Mountain, New Hampshire, for the establishment on the Cherry Mountain timber sale area on the White Mountain National Forest of a series of permanent sample plots in connection with the spruce methods of cutting study. The area selected is on the border line between the spruce lower slope and mixed spruce and hardwood types, and is representative of forest conditions in a considerable part of the northern portion of the region. Four one-half-acre plots with one hundred foot isolation strips are being established, three of which will be cut by different methods and the fourth used as a check plot. Cutting of both spruce and hardwood to low diameter limits according to present National Forest practice; selection cutting of the larger spruce and fir and the cutting of hardwoods to favor spruce and fir; and theclear cutting of softwoods, leaving the hardwoods intact, are the three methods being tried. On each of the cutting plots the brush is being disposed of by two different methods. On one-half it is left undisposed of as in the ordinary logging operation; on the other the softwood brush is being burned and the hardwood brush lopped according to present National Forest practice.

In addition to the main plots four reproduction strips 6.6' wide and comprising 17½% of the total area are being run across the plots at regular intervals. On these all established reproduction and larger tree growth are being tallied with descriptive notes as to ground cover, underbrush, fallen logs, etc. Eight more intensive reproduction plots, each 6.6' square, will be established more or less mechanically on each plot. These will be intensively mapped to show all vegetation and other significant features, and will be followed through to trace the establishment and development both of the vegetation now on the ground and of that which comes in after cutting.

P. R. Gast, who is being employed cooperatively by the station and the Harvard Forest primarily for fundamental studies in plant physiology and ecology, assisted in the establishment of plots. He was able to make a number of suggestions of value as to methods of work and data to be secured, and it is hoped may later be in a position to do some intensive work on the plots. Behre is making use of the plots, which were cut over for spruce about fifty years ago, to secure data on changes in form following this cutting for use in connection with his taper study. He is also measuring and tagging many of the trees to be left after the present cutting in order to secure an accurate record of changes in form following this.

An unfortunate incident connected with the establishment of the plots was a thirty-foot fall suffered by Field Assistant E. W. Gemmer, when the safety strap which he was using in connection with increment borings at different heights up the tree became unbuckled. The fact that he fell against another tree immediately behind that on which he was working enabled him to land on his feet, and probably saved him from very serious injury. He is now able to move about again, but the latest advice is that he will probably be incapacitated for field work for another two months.

Some little progress was made in connection with the study of the relation between fire and weather conditions. Several sling psychrometers were distributed to the State foresters of New York, Connecticut, and Maine, but the latter felt that he was not in a position to make use of them this season. One of the New York district rangers' reports after a short trial that there appears to be a marked relation between relative humidity and fire hazard. (Mr. Osborne please note.) Some progress has also been made in arranging for the distribution of fire weather forecasts by Weather Bureau officials to the State foresters in the Northeast. Final arrangements are pending the straightening out of some apparent difference of opinion between the section directors in New York and New England.

The station participated in the observance of a forestry day in connection with Farm and Home Week at the Massachusetts Agricultural College. This is the first time that forestry has been included in the subjects covered during this week. There was a fair attendance at the meetings, and a luncheon conference between a forestry committee of the county agents and representatives of the State Forester's office and the experiment station proved to be particularly valuable.

Dana made a short trip to Quebec to look over some of the permanent sample plots and other investigative work being conducted by the Dominion forest service in cooperation with the Laurentide Company. He was particularly interested in the emphasis now being laid by Canadian investigators on the selection of thoroughly representative and comparable areas for sample plots, on the establishment of adequate isolation strips, and on the use of each plot for a single study only rather than attempting to concentrate several studies on the same plot.

In their studies of methods of cutting the Canadians are now very largely abandoning the use of relatively few plots in which accurate records are kept of numbered trees. Instead they are depending on a much larger number of smaller plots mechanically located on strips in which no attempt is made to secure data on individual trees. It is their feeling that this method has the advantage of eliminating the element of judgment in the selection of plots and of making it possible to secure data over a much wider area.

Final arrangements were made during the month for a joint meeting at the Harvard Forest at Petersham on September 4 and 5 of the Northeastern Forest Research Council and the Northeastern States Subcommittee of the Advisory Committee of the Pulp and Paper Industry to the Department of Agriculture.

On August 15 Dana had an interesting conference with Dean Mann of the New York State College of Agriculture who has been selected by the International Education Board to organize its activities in agriculture in Europe, for which Dean Mann was sailing the next day to be gone two weeks. The International Education Board was established by John D. Rockefeller, Junior, in 1923, and aims to promote international education, with special reference at the outset to general science and to agriculture, by exchange of personnel and other appropriate means. The board is much interested in including forestry in its activities, and has requested that a definite program be presented for its consideration. This seems to offer a remarkable opportunity for bringing the foresters of this and other countries more closely together and for enabling us to take advantage of the best that Europe has to offer in the development of forest research here,

SOUTHWESTERN FOREST EXPERIMENT STATION

Krauch and Osborn returned from the Carsen and Santa Fe, where they had spent nearly two months measuring sample plots and examining plantations. The Douglas fir and spruce plantations established on the Santa Fe 6-8 years ago are doing well. It is unfortunate that the Gallinas Nursery had to be discontinued just as the planting problem was being solved. Although the acreage is small it is probably sufficient to prove that the big burns of the Southwest can be reforested.

On August 10 and 11 Pearson examined yellow pine seedling plots on the Grand Canyon division of the Tusayan. Here as elsewhere on the Colorado Plateau, yellow pine history prior to 1919 is repeating itself - seedlings start in considerable numbers, but very few survive the second season. Cattle grazing on the Grand Canyon division is so severe that oak brush 6 to 8 feet tall is being killed.

Absence of the usual August rains has brought on a serious fire situation throughout Arizona. At the experiment station the precipitation in July was about two-thirds of the normal amount, but in August the rains failed completely. On portions of the Coconino, practically no rain has fallen since last April. On August 19 a slash fire started by one of the S. & M. logging engines burned 40 acres on the west edge of the experiment station tract. But for the intervention of a patch of virgin timber, the fire fanned by a high wind would probably have been disastrous. This timber was secured from the lumber company by exchange. Had it been cut according to the usual practice on private lands, the fire would have had an uninterrupted sweep through some four miles of slash.

Between August 20 and the end of the month, Pearson studied the Douglas fir reproduction problem in the Sacramento Mountains of the Lincoln and the Graham Mountains of the Crook. Douglas fir bore a heavy seed crop in both of these mountains last year. Considerable numbers of seedlings have sprung up in the Sacramento, but in the Grahams, the light summer rains have not favored germination. Incidentally, the possibilities of Mount Graham for intensive forest management, and as a center for experimental work with Douglas fir were "discovered."

PACIFIC NORTHWEST FOREST EXPERIMENT STATION

August was marked by a two weeks' visit from Mr. Clapp and a week's visit from Mr. Munns. With them detailed plans for the carrying on of the Station were gone over so that the Station is now lined up for action.

Mr. Clapp and the Director made quite an extensive tour through western Oregon and Washington interviewing the State foresters, deans of the two forest schools, the president of O. A. C., editors of the lumber trade journals, and many lumbermen and foresters, getting their views on the field of work of the Station and suggestions as to the best place for headquarters. As a result of this trip the existence of theStation has had considerable publicity. Mr. Clapp has recommended that Portland be the headquarters, as it has the advantages of proximity to the District Office, an ideal geographic center to the region being served, and is increasingly becoming the outstanding "capital" of the western lumber industry. Since this decision was reached considerable search has been made for office quarters; the post office building is full and it will be necessary to rent rooms apart from the District Office.

The yield study crew under McArdle continued taking temporary plots in "normal" second growth Douglas fir in western Washington, working during the month 15 tracts with a total of 110 plots, mostly acres. Two of the tracts were studied by E. T. Allen in 1899 and a comparison of the two sets of data showing the changes of 25 years is going to be interesting. The movements of this crew have been expedited and exhilarated by a shiny new Dodge touring car with the Forest

Service shield and "Pacific Northwest Forest Experiment Station" on each side in gilt. This party was visited recently by Messrs. E. T. Allen, N. G. Jacobson and Jacobs of the Western Forestry and Conservation Association. The last two constitute the Research Department of this association and are making themselves some study of Douglas fir growth this season for the particular information of their clients. Close cooperation, as indicated by this visit, between this association and the Experiment Station is going to be beneficial to both organizations.

Mr. Clapp and the Director also visited the "second growth" yield study crew in the field. Near where they were at work the latter was proud to show Mr. Clapp an "old growth" Douglas fir 15 feet 4 inches in diameter and 225 feet high up to the point 2 or 3 feet in diameter where its top was broken off.

At the Wind River branch (which Messrs. Clapp and Munns both visited) the fire-weather studies have continued. Simson spent a few days on a big fire on the Columbia Forest, watching its behavior instrumentally. Isaac with the help of a field assistant has been looking up and examining the several reproduction and cut-over land plots in the Wind River Valley. Among the many visitors at Wind River - who go partly to see the nursery and partly the experiment station and other activities - was Dean Winkenwerder of the University of Washington forest school.

A number of applications have been received for a place on the staff of the station, but unfortunately the allotment will not stretch.

A talk on the work of the station was made at the banquet of the West Coast Lumbermen's Association in Tacoma at their last monthly meeting, August 28.

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Work on the economic study was continued by Show during the first part of the month. On August 24 Show left for the Plumas to confer with Woodbury and Evans on the appraisal of fire damage on the recent fires near Quincy.

Show spent several days making the final revision of the public requirements reports, typing of which has just been completed.

Nothing was accomplished in Dunning's second attempt at working out a method of application of yield tables on the Tahoe. Three large fires occurred on the date of his arrival at Nevada City, on one of which he assisted for several days. Ayres, who has been transferred to the Tahoe, was to have assisted Dunning, but has been needed continuously on protection work.

It is evident that the season's field work cannot be completed. The fire situation has required considerable of Show's and Dunning's time and has disrupted the work of the technical men on the forests to such an extent that little can be expected from them, while Show's time is taken up by the important economic and fire damage studies. The schedule has been revamped with the hope of completing the more urgent jobs.

Dunning spent the period from August 12 to 21 on the Sierra taking increment borings on several old cutting areas for the preparation of growth prediction curves badly needed in management plan work. The earliest of these cuttings was made in 1865 and, due to the excellent site, growth has been so rapid that the rings showing the date of cutting could not be reached in dominant trees with the ordinary $11\frac{3}{4}$ inch increment borer. An effort is being made to secure a longer borer. Mr. Persons, of the Bureau of Entomology, helped Dunning for three days with increment borings to become familiar with our methods of making growth predictions.

While on the Sierra a half day was spent with Dr. Craighead, John Miller, Dr. Burke and Mr. Persons, all of the Bureau of Entomology, who were establishing sample plots on a recent burn to determine the relation of fires and insect attacks. It is hoped that by correlation of methods the fire damage plots of the Forest Service and the insect damage plots of the Bureau of Entomology will be of considerable mutual value. It is very evident that the relation between extent of fire injury and recovery cannot be worked out without information on the relation of subsequent insect attacks.

These fire damage studies bring out clearly the need for more fundamental knowledge of plant physiology. Data are lacking on the beginning, duration and ending of the growth period, where wood is first formed in the tree, etc., to really understand the effects of such factors as those of site, season of injury or relative vigor on recovery or insect attacks.

Miss Vinther was detailed for one week to the Tahoe to assist the local force with the large amount of office work occasioned by several large fires.

APPALACHIAN FOREST EXPERIMENT STATION

General

First steps toward the organization of a forest research council for the Southern Appalachian region were taken by Frothingham. This involved the preparation of a plan and considerable correspondence with reference to the personnel. Frothingham had several conferences with Colonel Joseph Hyde Pratt, formerly director of the North Carolina Geological and Economic Survey, who has taken a very lively interest in this. Marked interest has also been shown by others who have been written to, and it is hoped that the council will be organized and ready for action during the fall.

An excursion of county agricultural agents came to Asheville on the 20th. In the party were G. H. Collingwood, W. R. Mattoon, H. M. Curran, J. S. Holmes, and Harry L. Baker, the new Assistant Forester of North Carolina. In the morning Frothingham accompanied them to the Biltmore Plantations to explain the methods and purposes of the thinning experiments being conducted there. In the afternoon Korstian joined the party on a trip to Canton, N. C., to inspect the Champion Fibre Company's forest nursery, which is being managed cooperatively by the company and the station. An immediate expansion of this nursery from the present annual capacity of 130,000 to 500,000 and soon to 1,000,000 is planned. The party also made a trip through the Champion Fibre Company's pulp and paper plant.

In connection with this demonstration trip of county agents, a conference was held at the station with Dr. B. W. Kilgore, Dean of the North Carolina College of Agriculture at Raleigh, Curran, Collingwood, Mattoon, and Holmes, with reference to proposed experiments in management at the Swannanoa Test Farm near Asheville. The question of the establishment of a forest nursery there was also taken up. Both Frothingham and Korstian had previously visited the 80-acre woodlands on the test farm, where opportunities appear favorable for permanent sample plot studies of thinning and reproduction.

Other visitors to the station were Donald Bruce of the Washington office; Shirley Allen, forester for the American Forestry Association; G. F. Gravatt and Dr. G. G. Hedgcock of the Bureau of Plant Industry; Professor W. H. Horning of the Pennsylvania State Forestry School at Mont Alto; and Dr. C. J. Humphrey of the Forest Products Laboratory.

Before leaving his field work on the Shenandoah National Forest, Haasis, at the request of Supervisor Marsh, spent a day with Ranger D. K. Hendee on the Hone Quarry Working Circle to help him make a start on a revision of the working plan.

Oak Study (TS-12)

At the beginning of the month McCarthy and Reineke were in the southern end of the Cumberland Plateau in Tennessee getting data on the oak study. J. L. Eaton, a rehabilitation student at the Georgia School of Forestry, joined the party on the 8th.

An attempt was made to secure from the tie cutting operations in this section data for volume tables. While this is called second-growth oak in this section, the trees are merely that part of the original stand left after previous cutting. In some instances individual trees have grown rapidly and because of long crowns, taper rapidly, but the greater part of this growth differs little from that of the original forest.

This section of Tennessee has furnished a large number of ties in the past decade, the cutting of the last few years being the third time cutting has been done on some tracts. The present stand on the sandstone top of the plateau is a mixture of scarlet, black, southern red, and chestnut oaks, with shortleaf and scrub pines. White oak is most common in the swales.

Even-aged stands in this section are largely restricted to growth on old fields. From the Cumberland and Hiawassee sections of Tennessee, the search for second-growth even-aged oak stands had, by the end of the month, extended north into Virginia where Field Assistant P. M. Wentworth spent some time on the search. Most of the suitable areas were found where cutting had been more nearly complete. Cuttings for charcoal furnished the best plots and are found in all oak types through Virginia.

Reproduction Studies

Korstian spent a few days making a preliminary outline of the problems relating to hardwood reproduction in the Southern Appalachians. The object of this was to enable us to analyze the subject of natural reproduction with reference to other projects. He also outlined some of the major reforestation projects that we ought to be studying. The importance of seed production studies is emphasized.

Haasis and Wentworth completed the preliminary records on the permanent sample plots for the study of natural regeneration after cutting near Liberty Furnace on the Shenandoah National Forest. The cutting on these plots will be done this fall and winter in connection with a fuelwood sale.

Study of Grazing Damage (Pa-1)

After finishing the Liberty Furnace work Haasis and Wentworth made a reexamination of the tagged reproduction on the Hone Quarry Run grazing damage sample plot on the Shenandoah. Unfortunately, at some time during the past year the fence was broken, perhaps by a falling tree, and cattle got into the fenced area. We are therefore set back just a year in our study on this plot.

On the way back to Asheville, Haasis stopped for a couple of days to discuss the grazing situation with Supervisor Stoneburner of the Unaka and with men in charge of properties adjacent to or near the Unaka National Forest. In this region most of the grazing is in carefully prepared pastures and forest grazing is of strictly minor importance. Indeed, one man expressed the opinion that cattle would "pay better attention to business" if they didn't even have shade trees in the pasture. The consensus of opinion seems to be that forest grazing may do for growing cattle but that for fattening pasture is far superior.

LIBRARY

Last month the library loaned 717 books and periodicals, and 102 members of the Service and others consulted the library in person. There were 193 books and periodical articles indexed for the catalogue.

MANUSCRIPT NEWS NOTES

Priest River

The Application of Normal Yield Tables. I. T. Haig. (To Journal Forestry.)

Root Hairs and Zones of Absorption in Pine Nursery Stock. W. G. Wahlenberg. (To American Nurseryman.)

Lightning in Relation to Forest Fires in Northern Idaho and Montana. H. T. Gisborne. (To Canada Lumberman.)

Stimulating the Growth of Engelmann Spruce in the Nursery. W. G. Wahlenberg. (To the Timberman, American Florist, and Orchard and Farm.)

Some Results of Winter Slash Disposal. G. Kempff. (To The Timberman and Pulp and Paper Magazine.)

Southern

How Fast Should a Face be Raised in Chipping Timber? Lenthall Wyman. (To Weekly Naval Stores Review.)

Appalachian

Density of Cell Sap in Relation to the Environmental Conditions in the Wasatch Mountains of Utah. C. F. Korstian. (Page proof, Jour. Agr. Res.)

Southwestern

The Growing Season of Western Yellow Pine. G. A. Pearson. (Galley proof. Journal Agric. Res.)

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Weather Conditions and Forest Fires in California. S. B. Show and E. I. Kotok. (Jour. Agri. Res.)

The Management of Forest Properties in the California Pine Region as a Problem in Applied Ecology. S. B. Show. (Scientific Monthly, galley proof.)

In Print

State Fire Report - Form

Forms 562A, B, C, and D and 563 - Cumulative records of sample plots.

Frothingham, E. H. Forest Research; the Basis for Sound Development of North Carolina's Forest Industries. Published by the North Carolina Forestry Association, March 1, 1924.

Gisborne, H. T. Save the Forests and Protect the Highways. Highway Magazine, July, 1924.